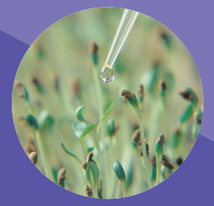
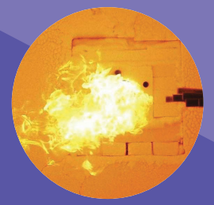
Natural Gas Technologies II

Ingenuity & Innovation

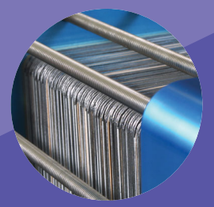
A GTI CONFERENCE & EXHIBITION

February 8-11, 2004
Pointe South Mountain Resort
Phoenix, Arizona





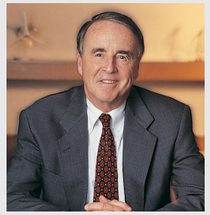
If you're a decision-maker in the energy field, this is the one conference you cannot afford to miss!



gti℠

Cosponsored by the U.S. Department of Energy's National Energy Technology Laboratory

I'm pleased to extend a personal invitation to attend GTI's Natural Gas Technologies II Conference and Exhibition, set for February 8-11, 2004, in Phoenix, Arizona.



As a leader in research, development, and training for gas and energy markets, GTI is eager to show you our industry's latest technologies for finding, producing, delivering, and using natural gas, plus other intriguing gaseous fuel concepts that may emerge in the decades ahead.

The theme for this, our second, major technology conference is *Ingenuity & Innovation,* and you'll find evidence of both in abundance at this event.

Research organizations, manufacturers, and product and service providers stand ready to describe a wide range of technologies that deliver value to our industry, your company, and your customers. You can also choose from more than 275 technical presentations, in ten technology tracks, that span the entire natural gas industry.

Join us in Phoenix to update your technology perspective, to network with friends and colleagues, and to enjoy the many attractions that the Phoenix area offers.

I look forward to seeing you at the Natural Gas Technologies II Conference and Exhibition.

John F. Riordan

John F. Riordan
President and CEO, GTI

If you're a decision-maker in the energy field seeking new technology solutions to help grow your business, increase your bottom line, and better serve your customers, this conference is for you!

More than 600 people attended GTI's first technology conference/exhibition in October 2002, *Natural Gas Technologies: What's New & What's Next.* We anticipate an even larger turnout for *Natural Gas Technologies II: Ingenuity & Innovation*, February 8-11, 2004, in Phoenix.

We've expanded virtually every discipline, especially Exploration & Production, and new for 2004 are a Distributed Generation track and a DOE-NETL Natural Gas Forum.

This conference features over 275 presentations on commercially available and emerging technologies from every segment of the gas industry.

Experts from industry, academia, and government will discuss a wide range of energy topics, supplemented by peer-to-peer networking at the conference reception, breakfasts, luncheons, and refreshment breaks. With so many concurrent sessions each day, you'll want to bring a team from your company to get the most from this event.

In parallel with the conference, providers of energy-related products and services will demonstrate an array of technology solutions that you can put to use right now.

The conference is cosponsored by the U.S. Department of Energy's National Energy Technology Laboratory and is being held at the Pointe South Mountain Resort in Phoenix.

In view of recent concerns about the price and availability of natural gas, what will it take to meet our country's growing demand for this premium fuel?

A big part of the answer is continued advancement of technology for finding, producing, delivering, and utilizing natural gas in ways that are clean, secure, efficient, and affordable.

As a leader in energy technology development, GTI presents this premier conference event to show how the gas industry's ingenuity and innovation are yielding new products and services that not only address national needs but also can help make your company more productive and profitable.

The Natural Gas Technologies II Conference and Exhibition presents new technologies from every facet of the natural gas industry in the following ten information-packed session tracks.

Spencer Abraham, U.S. Secretary of Energy
Anticipated keynote speaker

No other single conference focuses on new natural gas technologies from the wellhead to the burner tip.

Environmental

Monday	**Session 1** Environmental I: MGP Site Remediation 1	**Session 2** Environmental II: MGP Site Remediation 2	**Session 3** Environmental III: DNAPL and Solvent Treatment	**Session 4** Environmental IV: Characterization and MGP Site Remediation	**Session 5** Distribution I: Detection Sensor and Repair Technologies	**Session 6** Distribution II: Plastic Pipe	**Session 7** Distribution III: Leak Detection	**Session 8** Combustion I: Industrial Applications	**Session 9** Exploration & Production I: Drill Pipe and Completion Technologies	**Session 10** Transmission: Pipeline Monitoring, Operations and Protection	**Session 11** Gas Quality	**Session 12** Technical Spectrum	**Session 13** Distribution IV: Excavation and Restoration	**Session 14** Environmental V: MGP—Thermal Disorption of Soils	
Tuesday	**Session 1** Environmental I: Toxics; Air Monitoring	**Session 2** Environmental II: Water Management Issues and Technologies	**Session 3** Environmental III: Mercury Emission Control Program and Technologies	**Session 4** Environmental IV: Risk-Based Site Remediation and Napthalene Issues	**Session 5** Distribution I: Detection Sensor and Repair Technologies	**Session 6** Distribution II: Trenchless Technology; Operations and HDD	**Session 7** Distribution III: Operations and Plastic Pipe	**Session 8** Combustion I: Food Service; Engine Applications	**Session 9** Exploration & Production I: Drilling Technologies	**Session 10** Transmission: Pipeline Inspection and Evaluation	**Session 11** Gas Quality/ Odorization	**Session 12** Technical Spectrum	**Session 13** Combustion II: Industrial; Distributed Generation; Residential/ Commercial	**Session 14** Combustion III: Residential/ Commercial; Power/Utility	**Session 15** DOE-NETL Natural Gas Forum
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The Environmental track incorporates GTI's 16th Site Remediation & Environmental Conference

Monday, Session 1
Environmental I: MGP Site Remediation 1

Implementation of a Program—Wide Environmental Information Management System
Paul Boison, Northeast Utilities Service Company and Mary E. House, Woodard & Curran

Former MGP Contamination—"Expected and Intended Impacts"—A Historical Perspective
Dennis Ruben, GZA

Microbial/Plant Approaches for Phytoremediation of Hydrocarbon-Contaminated Soils
Bill W. Bogan, Wendy R. Sullivan, and Thomas D. Hayes, GTI

Case Study: Removal of Consolidated Coal Tar Deposits from the Connecticut River
Paul J. Boison, Northeast Utilities Service Company, Aaron Christie and William C. Heiple, Metcalf & Eddy

Bench-Scale Testing as a Tool for Design and Permitting of Remediation of Coal Tar Deposits in the Connecticut River
William C. Heiple, Metcalf & Eddy and Paul J. Boison, Northeast Utilities Service Company

Successful Remediation at a Former MGP Site in a Highly Populated Urban Setting
Larry F. Milner, Margaret Kelley, and Grant Zoldowski, Burns & McDonnell, Steven J. Matuszak and Christopher F. Szela, Peoples Energy

Monday, Session 2
Environmental II: MGP Site Remediation 2

Results of Chemical Fingerprinting of Sediments and Soils in the Location of a Former MGP Site, Superior, Wisconsin
Diane Saber, GTI, William Bombich, Superior Water, Light and Power Company and William Gregg, ENSR International

Pilot Scale Treatment of MGP Groundwater for the Removal of Iron Cyanide
Thomas D. Hayes, Bhupendra K. Soni and Mike Vianzon, GTI

New Development in Third Party Pipeline Monitoring
Angelo Fabiano, NYSEARCH, George Ragula, PSE&G and Jim Walton, Radiotection

In-Situ Chemical Oxidation Using Fenton's Reagent to Treat Residual Contamination at Two Former Manufactured Gas Plant Facilities
Ishwar Murarka, Ish, Inc., David Asti, The Southern Company, Roger Whiting, Consumers Energy, and James Wilson, Geo-Cleanse International, Inc.

In-Situ Chemical Oxidation (ISCO) Applications at MGP Sites
Duane K. Root and J. David Mannion, Shaw Environmental, Inc.

Dissecting the Dragon—A Case Study Using In-Situ Chemical Oxidation to Locate and Differentially Destroy Residual MGP Contamination in Soils Groundwater
William L. Lundy, BMS, Inc.

Monday, Session 3
Environmental III: DNAPL and Solvent Treatment

Repeated Re-use of Reductive Compounds for the Preparation of Bimetalic Nanoscale Particles for Chlorinated Organic Contaminants Remediation and Heavy Metals
Bhupendra K. Soni, Thomas D. Hayes and Michael Vianzon, GTI

Application of "Thermal Conductive Heating/In-Situ Thermal Desorption (ISTD)" to the Remediation of Chlorinated Volatile Organic Compounds in Saturated and Unsaturated Settings
John LaChance, Ralph S. Baker and John Bierschenk, TerraTherm, Inc.

Review of EPRI Barriers and NAPL Characterization Reports
Ash Jain, EPRI and John Fountain, North Carolina State University

Simultaneous Removal of Chlorinated Compounds and Heavy Metals from Groundwater
Bhupendra K. Soni, Thomas D. Hayes and Michael Vianzon, GTI, Louis Apoldo and Harch Gill, Pars Engineering Inc., and Wayne Wittman, PSE&G

Innovative Heavy Oil Contaminant Mass Reduction at Typical MGP Remediation Sites
Douglas D. Carvel and Richard T. Carwright, MECx, LLC

Cost Effective Application of ISS at a MGP Site
Ernie Pollitzer, Tetra Tech FW

Monday, Session 4
Environmental IV: Characterization and MGP Site Remediation

Cost Allocation at a Former MPG and LUST Site, Neenah, Wisconsin
William M. Gregg, ENSR International

Remediation and Property Restoration at a Former MGP Site in a Small Town Setting
Donna Davis, Joan Gonzalez, Larry F. Milner, Burns & McDonnell and Claudia Macholz, Nicor Gas

Carbon Isotope Ratios of PAHs in Urban Background Soil
Diane Saber, GTI, David Mauro, META Environmental, Inc., Paul Philp and Jon Allen, University of Oklahoma

A NYSEG Field Evaluation of Emerging MGP Site Assessment Technologies
Allen Peterson, NYSEG

Model for the Assessment and Remediation of Sediments (MARS): Recent Modifications with Applications to Tidal Rivers and Future Plans
Ash Jain, EPRI, Ferdi Hellwweger, HydroQual, Y. Skorobogatov, ConEd, M. Gallucci, CHG&E, Jim Lingle, We Energies, and Tracy Blazicek, NYSEG

Seamless Replacement of a PCB-Impacted Oil Recovery System at a Former MGP Site
Daniel A. Norden, Timothy M. Long, Baltimore Gas & Electric Company, Dale R. Foster, Jacob A. Bourdeau, KEY Environmental, Incorporated

Monday, Session 14
Environmental V: MGP—Thermal Disorption of Soils

Effect of Ozone and Moisture on Thermal Solidification of Contaminated Tars in Large Process Development Units
Thomas D. Hayes, Bhupendra K. Soni, Mike Vianzon, Amrutha Dharam and Vipul J. Srivastava, GTI

In-Situ Thermal Desorption of PAHs from Lampblack Impacted Soils Using Natural Gas Combustion: Results of Phase II Field Pilot Test
Masood Hosseini, Sempra Energy Utilities, Tom Harmon, UCLA and John Barbay, TPS Technologies, Inc.

Full-Scale Application of In-Situ Thermal Destruction of MGP Waste in a Former Gas Holder
Ralph S. Baker Ph.D., John LaChance, Mark Kresge, and Robert J. Bukowski, TerraTherm, Inc.

A Case Study of Remedial Action and Closure at a Former Manufactured Gas Plant Site
Dennis G. Tuttle and Edward P. Van Doren, Shaw Environmental, Inc.

An Innovative Solution for MGP Residual Sludge Stabilization Within a Former Quarry
Frederic H. Diehl and Kimm Perlin, Jacques Whitford Company, Inc., and Jennifer L. Sowers, PECO Energy Company

Chemical Oxidation of MGP Residuals and Dicyclopentadiene at a Former MGP Site
David Robinson, Richard Brown, Jay Dablow, Environmental Resources Management and Ken Rowland, Sempra Energy Utilities

Tuesday, Session 1
Environmental I: Toxics; Air Monitoring

Advantage of Independent Real-Time Perimeter Air Monitoring
Bruce Scamoffa, AirLogics, LLC

Evaluation of Real-Time and Time-Integrated Air Monitoring & Odor/Emission Control Methods During Remedial Action at Former MGP Sites
A. Jain, EPRI, J. Ferraiuolo, Public Service of New Mexico, W. Hoynack, Northeast Utilities, W. Mueller, Ameren

A Detailed Look at and Comparison of the Design and Operational Aspects of Two MGP Site Remediation Perimeter Ambient Monitoring Programs
Leo J. Gendron, ENSR International

Fenceline Air Monitoring at Former MGP Sites: What Can Go Wrong
Anthony M. Sacco and Laura McMahon, ENSR

Extending Sampling Durations for Time-integrated Air Monitoring Samples During an MGP Remediation
Chris Dawdy, GEI Consultants, Inc. and Guy Graening, Air Toxics Ltd.

Comparing the Results from Residential Air Sampling to Vapor Intrusion Modeling
Bruce W. Ahrens, Larry Hottenstien, MWH Americas, Inc. and Tracy L. Blazicek, NYSEG

Background Levels of Benzene in Indoor and Outdoor Air
Lisa J.N. Bradley, Kelly Sullivan and Marcus Garcia, ENSR International, and Joe Ferry, NiSource Corporate Services Company

Tuesday, Session 2
Environmental II: Water Management Issues and Technologies

Environmental Water Management Issues
Daniel Gurney, NETL/NPTO

Tailoring Treatment Methods to Produced Water Properties: Using Unit Operation Studies to Build on GTI's Pilot Experience
Tom Hayes, Liese Dallbauman and Tanita Sirivedhin, GTI

Updated Information on Analysis of Water Management Alternatives and Beneficial Uses of Coal Bed Methane Produced Water
J. Daniel Arthur, ALL Consulting

Study of Natural Organic Matter (NOM) in Produced Water
Tanita Sirivedhin and Liese Dallbauman, GTI

Measurement, Characterization and Prediction of Organic Solubility in Produced Water
Joanna McFarlane, Oak Ridge National Laboratory

Organic and Inorganic Species in Produced Water: Implications for Water Reuse
Yousif K. Kharaka and Cynthia A. Rice, U.S. Geological Survey

Desalination of High-Concentration Solutions by Reverse Osmosis Using Zeolite Membranes
Liangxiong Li, Junhang Dong and Robert Lee, New Mexico Institute of Mining and Technology

FMGP Site Exploration Using Analytical Contaminant Transport Equations
Johanshir Golchin, Iowa DNR, Greg Stenback and Say Kee Ong, Iowa State University and Dean Hargen, Alliant Energy Company

Tuesday, Session 3
Environmental III: Mercury Emission Control Program and Technologies

The Department of Energy's Mercury Measurement and Control Program
Thomas J. Feely III, NETL

Evaluation of a Novel Carbon-Based Adsorbent Material for Controlling Mercury in Gas Emissions
Satya N. Varadhi, Michael Samuel and Vipul J. Srivastava, GTI and Nasrin R. Khalili, Mital Desai, Illinois Institute of Technology

A Novel Process for Mercury Removal from Natural Gases and Coal-Fired Power Plant Flue Gases
Aqil Jamal, Dennis Leppin and Osman Akpolat, GTI

Status of Research and Control of Mercury Emissions from Coal-Fired Boilers
Jim Kilgroe, U.S. Environmental Protection Agency

Selective Catalytic Oxidation of Mercury in Coal Combustion Flue Gas
Ho C. Lee and Tom Hastings, Cormetech, and Charles B. Sedman

Sorbent-Based Syngas Mercury Removal in the Ultra-Clean Process
Rachid B. Slimane, Raja Jadhav, Francis S. Lau, and John Pratapas, GTI, Richard A. Newby, Siemens Westinghouse Power Corporation, and Suresh C. Jain, NETL

Continuous Mercury Monitoring in Natural Gas, Flue Gas and Spill Response in the Gas Industry
J. Siperstein, S. Pogarev, V. Ryzhov, and S. Sholupov, Lumex, Ltd.

Environmental ◆ DOE-NETL Natural Gas Forum

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Comparison of Methods to Evaluate Indoor Air Exposures
S. Sager, J. R. Clarkson, D. Miller, N. Weinberg, B. Locey, D. Wisbeck, L. Smith, C. Lutes

Tuesday, Session 4
Environmental IV: Risk-Based Site Remediation and Napthalene Issues

The GTI Environmentally Acceptable Endpoints Program: Overview and Future Directions
Tom Hayes and Vipul Srivastava, GTI

Potential Changes in Naphthalene Toxicity Values: Implications for MGP Site Remediation
Sandra J.S. Baird, Alla Burmistrova and Charlie Menzie, Menzie-Cura & Associates, Inc.

Kinetic Studies on PAH Contaminated Soils for Oxygen Uptakes, Rapid-Release Fraction and Earthworm Toxicity/ Bioaccumulation Test
Bhupendra K. Soni, Thomas D. Hayes, Bill Bogan and Michael Vianzon, GTI

Comparison of PAH Desorption Rates into Water and into Supercritical Carbon Dioxide with the Bioavailability of PAHs from Manufactured Gas Plant Soils and Soots
Steven B. Hawthorne, Carol B. Grabanski, and David J. Miller, University of North Dakota, Joe Kreitinger, Cornell University, Dustin G. Poppendieck and Raymond C. Loehr, University of Texas

PAH Distribution Among Organic Matter Types in Contaminated Sediments and Effects on Bioavailability
Upal Ghosh, University of Maryland

Development of Environmentally Acceptable Endpoints for Sediment
Charlie Menzie, Menzie-Cura & Associates, Inc.

In Vitro and In Vivo Evaluation of PAH Availability from Polluted Soils and Sediments
Hoi-Ying N. Holman, Lawrence Berkeley National Laboratory, Patricia Durbin, Shirley Ebbe, Birgitta Kullgren, Miranda Mei, and Ingrid Zubieta, University of California

Characterization of the Equilibrium and Rate-Limited Aqueous Release of BTEX and PAHs from MGP Site Soil
William Rixey, University of Houston and Tom Hayes, GTI

Mobility and Bio-Availability of Aromatic Hydrocarbons in Lamp Black Soils
Tom Hayes, B. Soni and Vipul Srivastava, GTI

Wednesday, Session 1
Environmental I: Contaminated Sediment Management I

Overview of Contaminated Sediments Management
Danny Reible, Louisiana State University and Ash Jain, EPRI

Strategies for Assessing and Managing Sediment and Wetland Resources at Manufactured Gas Plant (MGP) Sites
J.A. Bleiler and C. Tammi, ENSR International, Robert Cleary, NiSource Corporate Services Company

Fishable and Swimable: A Followup Case Study of Successful Remediation of MGP-Impacted Sediments
Ashok Jain, EPRI, W. James Griswold, Muriel S. Robinette, William H. Haswell, Haley & Aldrich, Inc., Bea S. Hebert, PSNH and William J. Hoynack, NU

A Coincidence of Interests to Reduce Costs and Timeframe of Sediment Remediation at the Dover, New Hampshire Former MGP Plant
Bea S. Hebert, Public Service of New Hampshire, Muriel S. Robinette and W. James Griswold, Haley & Aldrich

Development of Analytical Criteria for Delineation of MGP-Impacted Sediments in Lake Champlain
Jerry Zak, GEI Consultants, Inc. and Tracy Blazicek, NYSEG

Wednesday, Session 2
Environmental II: Contaminated Sediment Management 2

Rapid Field Techniques for Determination of Environmentally Acceptable Endpoints in Saturated Soils and Sediments
Tom Hayes, GTI

Risk-Based Protocols for Management of Contaminated Sediments
Satya N. Varadhi, Bill Bogan, Thomas D. Hayes and Vipul J. Srivastava, GTI

The Environmental Compliance Assistance System—An Internet Information Resource
Angela B. Walker, Oak Ridge National Laboratory

In-Situ Chemical Oxidation and Oxygen Injection for Destruction of Organic Contaminants at a Former MGP Site
Richard Arnold, Brian Sielski and Steven Weber, Tetra Tech FW, Inc.

Wednesday, Session 3
Environmental III: Energy Industry Issues and Opportunities

Animal Waste to Marketable Products
Michael Roberts, GTI, Terry Adams, Changing Worlds Technologies, Jim Williams, Kvaerner Process Systems, Paul Halberstadt and Don Sanders, Renewable Environmental Solutions

Renewable Energy Opportunities from Biomass
David J. Stopek, GTI

Alternatives for the Generation of Green Energy from Waste
Tom Hayes, GTI

Use of Landfill Methane as a Greenhouse Gas Credit Generator in the Voluntary Greenhouse Gas Reduction Programs in the United States
Bruce K Maillet, Shaw EMCON / OWT, Inc.

Programmatic Biological Agreement for a Large Natural Gas Pipeline System
William Gorham, ENSR International

Wednesday, Session 4
Environmental IV: Site Redevelopment; Case Histories

Redevelopment of Manufactured Gas Plant Sites in the United States
Andrew Coleman, EPRI and Alan Gogan-Tilstone, Environmental Management Group

Is Product Recovery a Practical Remediation Approach for NAPL Contaminated Utility Sites?
Daniel M. Groher, ENSR Corporation

Fast-Track Gas Holder Remediation: A Case History in Residential Redevelopment
Thomas R. Plante, URS Corporation, Roy A. Koster, Central Maine Power Company

Use of In-Situ Technologies to Remediate an MGP in Michigan
Rob Ferree, Kevin Wilson and Fred Payne, ARCADIS

Integrated Environmental Design for Value-Added Waterfront Remediation
Jack Cox, Richard Arnold, Murat Utku, et.al., Tetra Tech FW, Inc.

Wednesday, Session 13
Environmental VI: Regulation Issues and Natural Attenuation

Experience from Three Sites on Use of Innovative Investigative Techniques and Development of a Protocol for MGP Site Investigations
Ash Jain, EPRI, Craig Shamory, PPL Utilities, Allen Peterson, Tracey Blazicek, New York State Electric & Gas Corp, Werner Max, Wayne Wittman, PSEG, Jim Cummings, U.S. EPA, and Karen Fromme, Key Environmental, Inc.

Monitored Natural Attenuation (MNA) at a Former Manufactured Gas Plant (MGP) Site
Edward P. Van Doren and Dennis G. Tuttle, Shaw Environmental, Inc.

Here's What Last Year's Attendees Had to Say:

"As always, GTI conducts a very informational and professional conference. I think the combination of topics was very rewarding and an effective use of time."
– Dan Meltzer, Southern California Gas Company

"Excellent conference—well organized with great speakers."
– Karen Stidger, Gas Utility Manager Magazine

New this year—Natural Gas Forum

Tuesday, Session 15
DOE-NETL Natural Gas Forum

Perspectives on Natural Gas Supply

Moderators
- John Duda, NETL
- Kent Perry, GTI

Panelists
- Federal Land Manager
- Investment Banking Community
- Environmental Community
- Diversified Energy Company
- International Market Perspective

Issues
- Federal lands access
- Environmental-produced water; other waste stream issues
- Permitting
- Market access-pipelines
- Access to capital
- Role of R&D-government interface with private sector/academia/not-for-profit
- Productive capacity (currently much lower than optimal)
- International gas market-supply; LNG
- Non-traditional resources-coalbed methane; landfill methane
- Regional water issues

Perspectives on Natural Gas Demand

Moderators
- Julianne Klara, NETL
- Melanie Kenderdine, GTI

Panelists
- Investment Community
- Diversified Energy Company
- Major Industrial Gas User
- American Gas Association
- Environmental Community

Issues
- Natural gas price impact on electric generation, industrial productivity, the residential consumer, and the economy
- Increased use of natural gas for power generation
- Role of distributed generation
- Market access-pipelines
- Storage inventories
- Trends in new electric generating capacity
- Access to capital
- Environmental regulation
- Regional water issues
- Role of R&D-government interface with private sector/academia/not-for-profit

Natural Gas Technology and Policy—A Look Forward

Moderators
- Heather Quedenfeld, NETL
- TBD, GTI

Panelists
- Rita Bajura, NETL
- John Riordan, GTI
- TBD, President's Office of Science and Technology

Distribution

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Monday, Session 5
Distribution I: Detection Sensor and Repair Technologies

Mobile Remote Methane Leak Detection Demonstration
M. B. Frish, R.T. Wainner, M. G. Allen and B.D. Green, Physical Sciences Inc.; G. Midgley, Heath Consultants

Airborne, Optical Remote Sensing of Methane and Ethane for Natural Gas Pipeline Leak Detection
Jerry A. Myers, Ophir Corporation

Advanced Airborne Natural Gas Leak Detection System Overview
Daniel Brake, Michael Clayton and Steven Stearns, Eastman Kodak Company

Detection of Unauthorized Construction Equipment in Pipeline Right-of-Ways
James E. Huebler, GTI

Detection of Non-Metallic Buried Facilities Using GPR
William J. Steinway, CyTerra Corporation

Development of Capacitance Probe Sensor for Plastic Pipeline Integrity Assessment
Mahendra Mathur, National Energy Technology Laboratory and Esmail Monazam, REM Engineering Services

Monday, Session 6
Distribution II: Plastic Pipe

Correlating Aldyl "A" and Century PE Pipe Rate Process Method Projections With Actual Field Performance
Gene Palermo, Palermo Plastics Pipe (P^3) Consulting

Keyhole Squeeze-Off Tool to Enable Repair of Large (4" & 6") Polyethylene Gas Pipes
Kenneth H. Green, Timberline Tool

Effects of Surface Scratches on Life Expectancy and Long-Term Field Performance of Plastic Polyethylene Pipes Used in Gas Distribution Systems
Michael Mamoun, Steve Gauthier, and Paul Beckendorf, GTI

Polyethylene Natural Gas Pipe Field Failure Analysis and Case Studies
Daniel Ersoy, GTI

Design and S-4 Testing Methodology to Mitigate Rapid Crack Propagation in Large-Diameter Plastic Polyethylene Gas Piping
Michael Mamoun, Steve Gauthier, and Paul Beckendorf, GTI

Cross-Linked Polyethylene Pipes Candidate for the Transport of Natural Gas Offer Enhanced Long-Term Structural Strength and Field Performance Advantages
Michael M. Mamoun, GTI and George Ragula, Public Service Electric and Gas Company

Monday, Session 7
Distribution III: Leak Detection

Field Testing the Digital Leak Detector
James E. Huebler, GTI

Remote Survey of Distribution Networks
Frédérique Bournazaud, François Cagnon, Gaz de France; Andreas Hoffstaedt, Matthias Ulbricht, ADLARES Gmbh

New Handheld Optical Portable Methane Detector
Harold Lessure, Carnegie Mellon University and Kiran Kothari, GTI

Pipe Leak Pinpointing Using a Methane-Utilizing Biosensor
J. Robert Paterek and Kristine Cruz, GTI

Laser-Based Remote Sensing of Gas Distribution Leaks
Roger Farmer, AVISYS, Inc., Thomas McRae, Laster Imaging Systems and Kiran Kothari, GTI

Development of a Remote Methane Leak Detector
Angelo G. Fabiano, New York Gas Group and B. D. Green, Physical Sciences Inc.

Monday, Session 13
Distribution IV: Excavation and Restoration

Trench Excavation Support: How to Ensure Success
Tennyson M. Muindi and Daniel J. Dobbels, Haley & Aldrich, Inc.

Evaluation of Backfill Materials in Pavement Restoration
Khalid Farrag, GTI

Evaluation of Compaction Measuring Devices
Daniel Vetter, GTI

Comparison of Plastic Pipe and Select Fill Requirements
Keen Nyamwange, GTI

Development of Spray Shoring for Trenched Excavations
Bruce Campbell, GTI

Cured-In-Place Lining: Improving Structural Integrity
Angie Wood, GTI

Tuesday, Session 5
Distribution I: Detection Sensor and Repair Technologies

"Live" Repair of Steel and Cast Iron Gas Mains Using Robotics Technology
Gerry Pittard, Maurer Technology, Inc., Kiran Kothari, GTI, and George Ragula, Public Service Electric and Gas Company

Explorer: Long-Range Untethered Real-Time Live Gas Main Inspection System
Hagen Schempf, Carnegie Mellon University Robotics Institute and George Vradis, Polytechnic University

Robotic Pipeline Inspection System
William Leary, Robert Torbin, Foster-Miller, Inc., and George Vradis, Polytechnic University

GasNet™: In-Pipe Real-Time Data-Gathering and Communications Network for Distribution Gas Pipe Networks
Noellette Conway and Hagen Schempf, Automatika, Inc.

Pipelines as Communication Network Links
Kelvin T. Erickson, University of Missouri-Rolla

Detection and Location of Damage in Real Time
Karen A. Moore, Renewable Energy and Power Technologies

A Multi-Sensor Data Fusion System for Assessing the Integrity of Gas Transmission Pipelines
Philip Kulick, Michael Lewitt, Joseph Oagaro, Stefan Krause, Robi Polikar, John Chen, John L. Schmalzel and Shreekanth Mandayam, Rowan University

Capacitive Tomographic Sensor for the Detection, Location, and Imaging of Sub-Surface Non-Metallic Pipes
Brian J. Huber and Chris Ziolkowski, GTI

Handheld Technology Improves Field Data Collection
John A. Kinast, GTI

Tuesday, Session 6
Distribution II: Trenchless Technology

Trenchless Technology in the Gas Industry—Mature, Emerging, and Promising Technologies
Allen Spivey, GTI

Key to Successful Installation of Pipe Using Trenchless Methods
Daniel J. Dobbels and Tennyson M. Muindi, Haley & Aldrich, Inc.

Opportunities to Reduce LDC Operating Costs
Paul Beckendorf and Tim Kurtz, GTI, and Bill Staats, Consultant

Merging Pipe Ramming and HDD
Brian Mattson, TT Technologies

Distribution II: Operations and HDD

The Mobile Pipe Locator Crew: Evaluation of the PipeHawk Radar, Vacuum Excavator and E-Line Locator for Trouble Locates
Allen Peterson, Daniel Wiser, Thomas Minichelli and Steven Hyde, NYSEG

Compact Directional Drilling Trend for Main and Service Installations in the Gas Utility Industry
Brian Mattson, TT Technologies

Electromagnetic Technology to Detect Active Obstacles During Horizontal Directional Drilling Operations
Gerry Pittard, Maurer Technology, Inc., Kiran Kothari, GTI, and Gene Crawford, Memphis Light, Gas and Water Division

Acoustic Technology to Detect Obstacles During Horizontal Directional Drilling Operations
Robert Cribbs, Folsom Research Inc. and Kiran Kothari, GTI

Obstacle Detection System Using Ground Penetrating Radar for Horizontal Directional Drilling (HDD) Operations
Alan Langman, Openfuel (Pty) Ltd., L.J. DuToit, EMSS Antennas (Pty) Ltd., Kiran Kothari, GTI, and David Hanson, Vermeer Manufacturing Company

Tuesday, Session 7
Distribution III: Operations and Plastic Pipe

North American Field Tests With Reinforced Thermoplastic Pipe (RTP)
R. Hermkens and M. Wolters, Gastec, B. Dalmolen, Pipelife, R. Tidball, Energy International, and A. Fabiano; Northeast Gas Association

Utilities are Extending the Pressure Limits on Plastic Piping Systems
Dennis Jarnecke, GTI

Mechanical Repair Sleeve for PE Pipe
Bart Hill, GTI

Enhance Service Line Splitting and Replacement System
Bart Hill, GTI

Monitoring Buried Piping for Early Detection of Corrosion
Glenn Light, Sang Kim, Bob Spinks, Hegeon Kwun

Automatic Reconnection Robot
Ken Tashiro, Tokyo Gas Co., Ltd.

Autonomous Internal Pipe Repair System
James Carter, Robert Torbin, Foster-Miller, Inc. and Magda Rivera, National Energy Technology Laboratory

Investigating Pipeline Integrity Using Broadband Electromagnetic Technology
Glyn Hazelden, Jason Consultants, Inc., George Ragula, PSE&G, and Paul Beckendorf, GTI

Expansion Plug—"McSquisher"
G.J. Prattinger and J. McGivery, Enbridge Gas Distribution

Wednesday, Session 5
Distribution I: Detection Sensor and Repair Technologies

Conformable Eddy Current Array for Mapping External Pipeline Corrosion
Alfred E. Crouch, Southwest Research Institute

Use of Nonlinear Harmonic Sensors for Detection and Characterization of Pipeline Mechanical Damage
Alfred E. Crouch, Southwest Research Institute

Remote Field Eddy Current Inspection for Unpiggable Pipelines
Albert Teitsma, GTI

Innovative Electromagnetic Sensors for Pipeline Crawlers
J. Bruce Nestleroth and Richard J. Davis, Battelle

Simple Method Predicts Location of Line Heaters in Natural Gas Transmission Pipelines
Saeid Mokhatab, University of Tehran

Wednesday, Session 6
Distribution II: Keyhole Technology and Stoppers

Keyhole Technology
Angie Wood, GTI

Internal Stopping Tool with Built-In Bypass for Blowing Gas
Bart Hill, GTI

One Person, Long-Armed Tool for Emergency Response to Blowing Gas
Bart Hill, GTI

Micro-Excavation
Mandy Ross, GTI

Service Applied Main Stopper (SAMS)
Bart Hill, GTI

Wednesday, Session 7
Distribution III: Robots; Field Utility Operations

Evaluation of Predictive Usage Model and Actual Weather to Set Meter Reading Alarm Limits
Thomas Broderick, Citizens Arizona Gas

Development of a Light-Weight, Low-Cost Handheld Pipe Locator
Daphne D'Zurko, NYSEARCH/ Northeast Gas Association

The Segway Human Transporter: Results of a Field Evaluation for Meter Rading and Gas Leak Surveys at NYSEG
Allen Peterson, NYSEG

Enhancements to Innerseal's Cast Iron Joint Sealing Process
Paul Salamondra and Dennis Jarnecke, GTI

The Development and Field Evaluation of Two PalmPilot Applications for Gas Field Operations at NYSEG
Allen Peterson, NYSEG

Combustion ◆ Exploration and Production

Monday	Session 1 Environmental I: MGP Site Remediation 1	Session 2 Environmental II: MGP Site Remediation 2	Session 3 Environmental III: DNAPL and Solvent Treatment	Session 4 Environmental IV: Characterization and MGP Site Remediation	Session 5 Distribution I: Detection Sensor and Repair Technologies	Session 6 Distribution II: Plastic Pipe	Session 7 Distribution III: Leak Detection	Session 8 Combustion I: Industrial Applications	Session 9 Exploration & Production I: Drill Pipe and Completion Technologies	Session 10 Transmission: Pipeline Monitoring, Operations and Protection	Session 11 Gas Quality	Session 12 Technical Spectrum	Session 13 Distribution IV: Excavation and Restoration	Session 14 Environmental V: MGP—Thermal Disorption of Soils	
Tuesday	Session 1 Environmental I: Toxics; Air Monitoring	Session 2 Environmental II: Water Management Issues and Technologies	Session 3 Environmental III: Mercury Emission Control Program and Technologies	Session 4 Environmental IV: Risk-Based Site Remediation and Napthalene Issues	Session 5 Distribution I: Detection Sensor and Repair Technologies	Session 6 Distribution II: Trenchless Technology; Operations and HDD	Session 7 Distribution III: Operations and Plastic Pipe	Session 8 Combustion I: Food Service; Engine Applications	Session 9 Exploration & Production I: Drilling Technologies	Session 10 Transmission: Pipeline Inspection and Evaluation	Session 11 Gas Quality/ Odorization	Session 12 Technical Spectrum	Session 13 Combustion II: Industrial; Distributed Generation; Residential/ Commercial	Session 14 Combustion III: Residential/ Commercial; Power/Utility	Session 15 DOE-NETL Natural Gas Forum
Wednesday	Session 1 Environmental I: Contaminated Sediment Management I	Session 2 Environmental II: Contaminated Sediment Management 2	Session 3 Environmental III: Energy Industry Issues and Opportunities	Session 4 Environmental IV: Site Redevelopment; Case Histories	Session 5 Distribution I: Detection Sensor and Repair Technologies	Session 6 Distribution II: Keyhole Technology and Stoppers	Session 7 Distribution III: Robots; Field Utility Operations	Session 8 Combustion I: Air Emissions	Session 9 Exploration & Production I: Emerging Gas Resources	Session 10 Fuel Cells/ Hydrogen		Session 12 Distributed Generation	Session 13 Environmental VI: Regulation Issues and Natural Attenuation	Session 14 Exploration & Production II: Gas Processing	

Monday, Session 8
Combustion I: Industrial Applications

Controlled Heat-Flux Infrared Radiant Heater Development
Stephen J. Sikirica, GTI

Development of Submerged Combustion Melting Glass Melting Technology
David Rue, GTI

Field Testing of a Low NO_x/ High Efficiency Radiant Tube Combustion System
Harry S. Kurek, GTI

Development of Dimpled Tube Technology for Heat Transfer Enhancements in Process Heaters
Harry S. Kurek, GTI

Pilot Scale Testing of an Innovative Combustion Technology for Gas-Fired Paper Drying
Harry S. Kurek, GTI

Development and Full Scale Laboratory Testing of a High-Efficiency (94%) and Ultra-Low Emissions (NO_x < 5 ppm) Industrial Boiler
Joseph Rabovitser and Rick Knight, GTI

Tuesday, Session 8
Combustion I: Food Service; Engine Applications

High Efficiency Gas Fryers Reduce Shortening Expense
Tom Stroozas, Piedmont Natural Gas

Commercial Gas-Fired Conveyor Fryer Enhancement
J. Tim Cole and Rich VanCamp, GTI

Commercial Charbroiler Improvement
M.F.G. Johnson and J. T. Cole, GTI

Development of Dual Deck Conveyor Oven
J. T. Cole and M.F.G. Johnson, GTI

Limitations on H_2 Addition to Natural Gas
H. B. Levinsky, Gasunie Research

Poly-Generation of Power, Heat, Syngas, Liquids, and Hydrogen from Natural Gas in Reciprocating Engine
Chol-Bum Kweon, Shain Doong, John Pratapas, Francis Lau, and Mark Khinkis, GTI

Laser Ignition of Natural Gas-Air Mixtures at High-Temperatures and High-Pressures
Sreenath Gupta and Raj Sekar, Argonne National Laboratory

Laser-Spark Ignition for Natural Gas Fueled Reciprocating Engines
Michael McMillian, Steve Woodruff, Dustin McIntyre and Steve Richardson, National Energy Technology Laboratory

Tuesday, Session 13
Combustion II: Industrial

Gas Technology Advisor
Stephen J. Sikirica, GTI

Creating the Scientific Basis for Comparing Fuel Oil and Natural Gas Options
Mark Colombo and Jim Fay, GTI

Combustion II: Distributed Generation

Comprehensive Monitoring of a Combined Heat and Power System: Microturbine, Hot Water, Absorption Chiller, and Turbine Inlet-Air Cooling
Calin Tarau and George Vradis, Polytechnic University, Mike Smalec, Southern Connecticut Gas Company & Connecticut Natural Gas Corporation

Stirling Engine-Based Residential Systems for North American Markets
Rich Van Camp, Tim Cole, Jim Fay, GTI and Mike Landau, Sempra Utilities

Combustion II: Residential/Commercial

Design Options and Considerations for a High Efficiency (Condensing), Integrated Space and Water Heating Gas Fireplace
Martin Thomas and Skip Hayden, Advanced Combustion Technologies (ACT)

Integrated Gas-Fired Heat and Light System: Development of a Novel Gas Illuminating Burner
Kuanrong Qiu and A.C.S. Hayden, Advanced Combustion Technologies

Testing Residential CHP Units at the CCHT
Michael Swinton, National Research Council of Canada, John Gusdorf, Natural Resources Canada

Development of a Unique Integrated System for Supplying Space Heating, Domestic Hot Water, and Ventilation
Ted Whitfield and David Furdas, Enbridge Gas Distribution, TBD, Natural Resources Canada, and TBD, National Research Council of Canada

Development of a Non-Catalytic Flameless Infrared Radiant Heater
P. Singh, B. Masterman, H. Kurek and S. Sikirica, GTI

Tuesday, Session 14
Combustion III: Residential/Commercial

Gas Technology Advances and Implications for the Commercial Service Water Heating Market
Greg Johnson, Piedmont Natural Gas

Effects of ECM Furnace Motors on Electricity and Gas Use, Based on Results from the CCHT Research Facility
David Furdas, Enbridge Gas Distribution, Craig J. Simpson, Craig J. Simpson Technical Services, TBD, Natural Resources Canada, and TBD, National Research Council of Canada

Residential Desiccant Transient Characteristics
J. Tim Cole and Rich VanCamp, GTI

Laboratory Testing of Brushless DC Motors (ECM Motors)
Martin Thomas and Skip Hayden, Advanced Combustion Technologies (ACT)

Combustion III: Power/Utility

Integration of Zero Emission Power Plants Using Clean Energy System's Technology, Gas Turbines, Air Separation Units and Steam Turbines
R. Anderson, H. Brandt, S. Doyle, L. Hoffman, K. Pronske and F. Viteri, Clean Energy Systems, Inc.

Experimental Study of a Novel Natural Gas Assisted Coal Preheating Technology for NO_x Reduction from Pulverized Coal-Fired Boilers
Joseph Rabovitser, Bruce Bryan, Sergeui Nester and Stan Wohadlo, GTI, TBD, All-Russian Thermal Engineering Institute, TBD, Riley Power Inc.

End-User Issues Arising from the Introduction of LNG Into "Pipeline-Gas" Markets
H. B. Levinsky, Gasunie Research

Wednesday, Session 8
Combustion I: Air Emissions

Development of a Formaldehyde Destruction Catalyst for Reciprocating Gas Engines
Hyo C. Lee, Gil Kraemer, Precision Combustion Inc. and Joe Weisbrod, Consultant

The EPA MACT Standard for Formaldehyde Emissions from Natural Gas Fired Turbines
Paul J. Drayton, GTI, Linda Flynn and Stan Coerr, Coerr Environmental Corporation

FIR Burner Delivers Low NO_x at Fullerton College
David Cygan, Vincent Gard and Joseph Rabovitser, GTI, and David Thornock, Johnston Boiler Company

Monday, Session 9
Exploration & Production I: Drill Pipe and Completion Technologies

Development of Cost-Effective and Improved Tubular Components for Deep Well Operations Using Microwave Technology
Dinesh Agrawal, J. Cheng, Paul Gigl, Mahlon Dennis, Roderic Stanley, and R. Roy, Pennsylvania State University

New Composite Drill Pipe Offers Advantages for Short Radius, Extended Reach/Deep Water, and DEEP TREK Operations
James Leslie, Advanced Composite Products and Technology, Inc. (ACPT, Inc.)

Very High-Speed Drill String Communications Network
David S. Pixton, Novatek, Inc.

High Temperature and High Pressure Real Time Downhole Wireless Gauge for Deep Well Gas Production Monitoring
Paulo Tubel, Tubel Technologies, Inc.

Development of a Wireless, Subterranean Telemetry System Utilizing Ultra-Low Frequency Electro-Magnetic (EM) Waves
Jeffery Gabelmann, P.E., and Robert A. Houston, E-Spectrum Technologies, Inc.

Investigation of Hydrate Inhibitors using Acoustic Resonance Spectrometry and a Differential Scanning Calorimetry
Alwarappa Sivaraman, Bhargav Sharma and Dennis Leppin, GTI

Tuesday, Session 9
Exploration & Production I: Drilling Technologies

Optimization of Deep Drilling Performance
Alan D. Black and Arnis Judzis, TerraTek Inc., et. al.

Drilling Optimization Utilizing Surface Instrumentation for Downhole Event Recognition Instrumented Top Sub for Event Recognition
John Cohen, Maurer Technology, Inc.

Exploration & Production/Gas Processing/Innovative Downhole Technologies Drilling Vibration Monitoring & Control System
Martin E. Cobern and Mark E. Wassell, APS Technology, Inc.

New Faster Drilling TSP Diamond Drill Bits
Robert Radtke, Richard Riedel and John Hanaway, Technology International, Inc.

High-Pressure Jet-Assisted Drilling
John H. Cohen, Maurer Technology, Inc.

Hydraulic Pulse Drilling Tools
Jack Kolle, Tempress Technologies Inc.

Mud Hammer Performance Optimization
Alan D. Black and Arnis Judzis, TerraTek Inc., et. al.

Down Hole Mud Hammer
David S. Pixton and Terry Seyler, Novatek, Inc.

Experimental Investigation of a Novel Perforation Technique in Petroleum Wells—Perforating by Drilling
M. A. Rahman, M. Koksal and M. R. Islam, Dalhousie University

Wednesday, Session 9
Exploration & Production I: Emerging Gas Resources

Elastic and Flow Properties of Hydrate-Saturated Sediments
Iraj A. Salehi, Changan M. Du, and Samih Batarseh, GTI

Exploratory Investigation of Production of Methane While Simultaneously Sequestering CO_2
Alwarappa Sivaraman, Bhargav Sharma and Dennis Leppin, GTI

A Field Study on the Exploration of Natural Gas Hydrate in Ulleung Basin of Korea
Jeong-Hwan, Lee Korea Gas Corporation

Valuation of Multi-Seam Completions for CBM Development In the Powder River Basin
John R. Duda, U.S. Department of Energy and Vello A. Kuuskraa, Advanced Resources International Inc.

Characterizing Complex Unconventional Gas Reservoirs Using Cutting-Edge Technologies
Carrie Decker and Robert Siegfried, GTI

Wednesday, Session 14
Exploration & Production II: Gas Processing

GTI Research Program in Direct Injection Scavenging
Dennis Leppin P.E., Aqil Jamal PhD, and Raj Palla, GTI

Direct Oxidation for Sulfur Removal for Gasifiers
Girish Srinivas and Steven Geb, TDA Research, Inc., Raj Palla and Dennis Leppin, GTI

Kyoto Protocol and the Future of Gas Processing Technology
Tony Kakpovbia, Anwar Mahmood, Glen Lee, and Frank Gareau, Alliance Engineering & Inspection Ltd.

CrystaSulf-DO Process for Desulfurizing Ultra-Deep Natural Gas Near the Wellhead
Dennis Dalrymple, CrystaTech, Inc.

"Love the conference and the interactions. Keep up the good work!"

– Ash Jain, EPRI

Transmission ◆ Fuel Cells/Hydrogen ◆ Gas Quality/Odorization ◆ Technical Spectrum ◆ Distributed Generation

Monday	Session 1 Environmental I: MGP Site Remediation 1	Session 2 Environmental II: MGP Site Remediation 2	Session 3 Environmental III: DNAPL and Solvent Treatment	Session 4 Environmental IV: Characterization and MGP Site Remediation	Session 5 Distribution I: Detection Sensor and Repair Technologies	Session 6 Distribution II: Plastic Pipe	Session 7 Distribution III: Leak Detection	Session 8 Combustion I: Industrial Applications	Session 9 Exploration & Production I: Drill Pipe and Completion Technologies	Session 10 Transmission: Pipeline Monitoring, Operations and Protection	Session 11 Gas Quality	Session 12 Technical Spectrum	Session 13 Distribution IV: Excavation and Restoration	Session 14 Environmental V: MGP—Thermal Disorption of Soils	
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Monday, Session 10
Transmission: Pipeline Monitoring, Operations and Protection

A New Algorithm Predicts Pressure and Temperature Profiles of Gas/Gas-Condensate Transmission Pipelines
Saeid Mokhatab, Tehran University

New Developments in Large Pipeline Video Inspection
Angelo Fabiano, NYSEARCH, Greg Penza, ULC Robotics Inc.

Modeling Pigging Process in Three-Phase, Gas/Gas-Condensate Transmission Lines
Saeid Mokhatab, Tehran University

Status of Real-Time Acoustic Monitoring of Contact to Pipelines
James E. Huebler, GTI

High Power Four Stroke Lean Burn Gas Engines with Centrifugal Compressors in Main Transmission Applications
Bill Amundsen, Wartsila North America, Inc. and David Atwood, Voith Turbo Transmission

Protecting Natural Gas Facilities from Terrorist Attack
Ed Badolato, The Shaw Group

Tuesday, Session 10
Transmission: Pipeline Inspection and Evaluation

New Technologies for Inspecting Gas Distribution and Transmission Lines
Albert Teitsma, GTI

Pipeline Flaw Detection Using Shear EMAT and Wavelet Analysis
Venugopal K. Varma, Raymond W. Tucker, Jr., Stephen W. Kercel, Joseph Rose and Wei Luo, Oak Ridge National Laboratory

Survey of Acoustic Signals in Natural Gas Transmission Lines
John L. Loth, Gary J. Morris and Richard Guiler, West Virginia University

Development of Internal (Trenchless) Repair Technology for Gas Transmission Pipelines
W.A. Bruce, D. D. Harwig and J. R. Gordon, Edison Welding Institute, M. Sullivan and C. Neary, Pacific Gas & Electric

Gas Coupled Ultrasonic Pipeline Inspection
Albert Teitsma, GTI

Case Studies on Indirect Inspections For External Corrosion Direct Assessment
David W. D'Ambrosio, GTI

Evaluation of Field Applied Coating Systems for Steel Pipelines
Josie Riggio, GTI

Microbiologically Influenced Corrosion of Gas Pipelines: Insights from Microbial Ecology Studies
Xiangyang Zhu, John Lubeck, Kristine Lowe, Gemma Husmillo, Amrutha Daram, J. Robert Paterek, and John J. Kilbane II, GTI

Cyber-Attack On Gas SCADA System: Demonstration and Analysis
Joseph W. McCarty and William F. Rush, GTI

Wednesday, Session 10
Fuel Cells/Hydrogen

Advances in Fuel Cell Technology: Path to Commercialization for Natural Gas Fuel Cells
Robert J. Remick, GTI

Hybrid Fuel Cell/Microturbine Energy Systems Simulation and Performance Optimization
Evgueniy Entchev, Advanced Combustion Technologies Laboratory

When Hydrogen Research was Driven by the Gas Industry
Robert J. Remick, GTI

Hydrogen Delivery Research and Development Needs
Sara M. Stinespring, Dr. Rodney J. Anderson, and Dr. Daniel J. Driscoll, National Energy Technology Laboratory

Superadiabatic Partial Oxidation for Hydrogen Production from Hydrogen Sulfide: Process Options and Economics
Rachid B. Slimane, Francis S. Lau, Remon J. Dihu and Mark Khinkis, GTI, Alexei V. Saveliev, Jacques P. Bingue, Lawrence A. Kennedy, University of Illinois, and Douglas W. Hooker, U.S. Department of Energy

Monday, Session 11
Gas Quality

Prevention of Freezing in Measurement and Regulating Stations
David J. Fish, Welker Engineering Company

Analysis of Nitrogen Species in Fuel Gases and Liquids
Karen Crippen and Russell Bora, GTI

Measuring the Moisture Content of Natural Gas, a Nightmare or an Accurate Guess?
Osman M. Akpolat, Raj Palla, and Howard S. Meyer, GTI

Improving the Copper Strip Corrosion Test
Wendy C. Andersen, Gerald C. Straty and Thomas J. Bruno, National Institute of Standards and Technology

Gas Interchangeability: How Europe Deals With It?
François Cagnon, Philippe Meunier, Olivier Marquer, Gaz de France

Methane Selective Membranes for Nitrogen Removal from Low Quality Natural Gas—High Permeation Is Not Enough
Howard S. Meyer, GTI and Michael Henson, University of Massachusetts Amherst

Tuesday, Session 11
Gas Quality

Bioregenerable Selective Sorbents for Hydrogen Sulfide Removal From Natural Gas
Brandy R. Fidler, Kerry L. Sublette, The University of Tulsa, Gary E. Jenneman, ConocoPhillips and Greg A. Bala, INEEL

D.O.T. Requirements for the Transportation of Sample Cylinders
David J. Fish, Welker Engineering Company

Hydrocarbon and Water Dewpoint with a Field-Installed Transmitter
Andy Benton, Product Specialist, and Andrew Stokes, Technical Director, Michell Instruments, Ltd.

Practical Considerations of Gas Sampling and Gas Sampling Systems
David J. Fish, Welker Engineering Company

Odorization

Investigation of New Methods for Detection of Gas Odorants, Odorant Fading and Odor Masking
Sherman Chao, Analytical Solutions, Inc.

New Mass Based Odorization System
Mark Zeck, Material Resource Recovery

How Odorizing Large Flows Helps to Improve Safety
Stéphanie Legrand, Gaz De France

Role of Activated Carbon for Control of Hydrogen Sulfide and Mercaptan Odors in the Natural Gas Industry
Charlie O'Rourke, Carbtrol Corporation

Odorant Spill Site Restoration
Jan Strmen, Material Resource Recovery

Monday, Session 12
Technical Spectrum

Creating Downstream Markets for LNG in the U.S.: The Missing Piece for Expansion
Tom Quine, Northstar Industries, Inc.

Add Diversity to Your Supply Portfolio; State of the Art Propane-Air Peak Shaving
John Heer, CenterPoint Energy Minnegasco

Spinning Out BTUs with Vortex Tube Technology
Howard S. Meyer, GTI, Donald V. Nicol and Mark J. Lane, Nicol & Associates, Inc., Douglas Moseley and Michael Campo, Florida Gas Transmission

Tri-Reforming of Natural Gas Using CO_2 for Production of Synthesis Gas to Dimethyl Ether
Seung-Ho Lee, Korea Gas Corporation

Field and Laboratory Tests with Crosslinked Polyethylene (PEX)
R. Hermkens and M. Wolters, Gastec, R. Tidball, Energy International, and A. Fabiano; Northeast Gas Association

Single-Phase Flow Approach Predicts Pressure Drop in Gas/Condensate Pipelines
Saeid Mokhatab, Tehran University

Tuesday, Session 12
Technical Spectrum

Optimization of Value-Cost-Price in Indian Gas Market
Sudarsan Paul, Bharat Petroleum Corporation, Ltd.

Sustainable Metropolitan Energy Planning: The Gas Industry's Opportunity & Contribution
Doug Newman, GTI

Embedding Sustainable Development in Energy Projects
John Shafer, ENSR International

The Application of Mems Technology to On-Line Analyzers for Natural Gas
Johan Bats, Instromet International

Design and Construction of an Offshore Energy Services Center: Bimini, The Bahamas, and Beyond
Derek G. Amidon, Haley & Aldrich, Inc.

Is Your Company Using the Best Technologies?
William R. Staats, Consultant, Athanasios D. Bournakis, Energy Resources Center, University of Illinois at Chicago

Leveraging Education Technology (e-Learning) to Enhance Regulatory Compliance and Field Implementation of GTI/Industry New Technologies
Richard Hinckie, Midwest Energy Association

Natural Gas Infrastructure Requirements for the Application of Distributed Generation Technologies
Babatunde O. Fapohunda, Science Applications International Corporation (SAIC)

Wednesday, Session 12
Distributed Generation

Emerging Distributed Energy Technology Demonstrations Through GTI's Distributed Generation Mutual Fund (DGMF)
Mark Stevens, Chuck Berry, and John Kelly, GTI

Ugly Ducklings or Just Plain Ugly? A Summary of NYSEG's Microturbine Experience
Allen Peterson, NYSEG

Optimizing Natural Gas Engine Driven On-Site Power Generation System Using Advanced Energy Modeling Tools
Marek Czachorski and John Kelly, GTI

Taking Cogeneration to a New Level: The BluePoint Lean-One
Dan Predpall, URS Corporation and Guy Archbold, BluePoint Energy, Inc.

Like to golf? Relax and enjoy the weather before the conference begins by participating in the NGT II Golf Tournament Sunday, February 8. The newly redesigned Phantom Horse Gold Club is a championship 18-hole course (par 71) with rolling hills and generous fairways on the front nine and pure desert on the back nine. There's a spectacular island green, a new clubhouse and pro shop, indoor golf training center, and much more. Take the challenge and win one or more of the tournament prizes!

Participation is $175 per person and includes green fees, cart, and a post-tournament reception. Complete the golf tournament section of the Registration Form in this brochure. The sign-up deadline is December 1, 2003.

Conference Registration Information

Delegate:
Register early and save up to $200.

Registrations received by November 8	$595
Registrations received November 9-December 31	$695
Registrations received after December 31 and on site	$795

Send a team and save even more:
When 3 or more delegates from the same company register at the same time, receive a discount of $100 per person. (Discount applies to the fee applicable on the date of registration.)

Delegate registration includes—

- Admission to all conference sessions
- Entry to the exhibit hall, beginning with a ribbon-cutting ceremony and champagne toast on Monday
- Three full breakfasts (Monday, Tuesday, and Wednesday)
- Two luncheons (Monday and Tuesday)
- Cocktail reception Monday evening
- Password-protected access to the conference papers on the Internet following the conference.

Presenter:
The presenter of each paper will receive the full delegate registration for $150. (Additional authors who attend the conference must pay the full delegate registration fee. Those presenting more than one paper pay only one Presenter fee.)

Accompanying Guest:
An accompanying guest is a spouse, family member, or friend who is not in an industry-related occupation. Accompanying guest registration may not be used by a co-worker or an associate within the industry.

Accompanying guests may attend the Monday evening cocktail reception in the exhibit are for a fee of $40 each. The resort concierge will be available to help guests plan optional activities during their stay.

Exhibitor:
Companies that have purchased a booth receive one complimentary full conference (delegate) registration. Additional booth personnel may register as Exhibitors at $250 each. This fee includes entry to all conference meals (three breakfasts and two luncheons) but does not include access to any of the conference technical sessions.

How To Register

Complete the Registration Form in the back of this brochure (only one registration per form; please duplicate as needed) and choose one of the following options:

- Mail completed form with check, money order, or credit card information to:
  NGT II Conference Coordinator
  Gas Technology Institute
  1700 S. Mount Prospect Rd.
  Des Plaines, IL 60018-1804 U.S.A.
- Fax completed form with credit card information to 847-768-0842. (If you fax your form to GTI, please do not also mail the original registration form.)
- Phone our Conference Coordinator at 847-768-0950 with complete registration and credit card payment information.
- Online: www.gastechnology.org/ngt

For questions about registrations, contact our Conference Coordinator at 847-768-0950; E-mail: ngt@gastechnology.org.

Only registration forms that are accompanied by the registration fee in the form of either 1) a check made payable to "Gas Technology Institute–NGT Conference," 2) a money order, 3) credit card information, or 4) a copy of bank transfer will be processed. Registration forms will not be processed until payment is received. You will receive confirmation of your registration the week of January 19, 2004.

Registration Materials

The conference Registration Desk will be open from 12:00 noon until 6:00 p.m. on Sunday, February 8. All delegates are encouraged to check in during those hours and pick up their registration materials, including a badge, which must be worn at all times for admission to the conference functions and exhibition.

Cancellation of Registration

All registration cancellations must be in writing letter, fax, or e-mail.

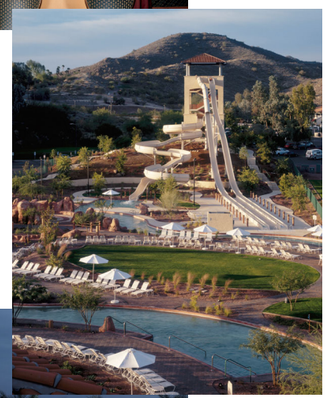
Delegates: Full refund of registration fees will be made for cancellations received by January 8. Full refunds, less a $100 processing fee, will be made for cancellations received between January 9 and January 30. Refunds will not be made after January 30, but a substitute delegate may attend. Refunds will be processed after the conference.

Why should YOU attend this conference? Here are the top 5 reasons:

1. Learning about the best, practical technology solutions—and how you can put them to work—will lead to a healthy future for you and your company.
2. You're a busy person. Getting the "inside story" from so many seasoned energy professionals in one place will save you time and money.
3. You'll have the opportunity to ask—and receive answers to—your most pressing concerns about natural gas technologies and how they can work for you.
4. You'll get reacquainted with old friends and meet new colleagues—priceless contacts in uncertain times.
5. Your peers—and the competition—will be there to get valuable information and useful ideas firsthand. Why not be among them?

Venue and Accommodations

Natural Gas Technologies II will be held at the Pointe South Mountain Resort, 7777 South Pointe Parkway, Phoenix, Arizona, 85044. Suites are reserved for conference participants at the special conference rate of $199, single or double occupancy (plus applicable taxes). Another person may share a suite with two adults for an additional $25 fee. This room block is available up to three days prior to and three days following the conference.



The Pointe South Mountain Resort features many attractive amenities, including comfortable meeting rooms (top), the Oasis Water Adventure (right), and the Oasis Bar for evening fun (below).

To reserve a suite, please contact the hotel directly at 602-438-9000 (FAX: 602-431-6535) by January 11 and be sure to mention that you are attending the Natural Gas Technologies Conference. Reservations made after January 11 will be accepted on a rate- and space-available basis. All reservations require one night's deposit by credit card, check, or cash within 28 days of placing the reservation. Cancellations of suite reservations must be received 72 hours before the arrival date for a full refund.

The Pointe South Mountain Resort is the largest all-suite facility in the Southwest, located on 300 acres adjoining South Mountain Park. Located just six miles from Sky Harbor International Airport, the resort features spacious suites—with separate sitting rooms and bedrooms, a work area, and a private patio or veranda—comfortable meeting rooms, and a variety of recreational facilities.

With four onsite restaurants, the Phantom Horse Athletic Club & Spa, the large Oasis Water Adventure (heated year-round), five lighted tennis courses, an 18-hole championship golf course, and many other amenities, Pointe South Mountain Resort will provide a relaxing, productive atmosphere for Natural Gas Technologies II participants.

Golf Tournament

Relax and enjoy the weather at the NGT II Golf Tournament on Sunday, February 8. It takes place at the Phantom Horse Gold Club—a championship 18-hole course (par 71).

Participation is $175 per person, and includes green fees, cart, and a post-tournament reception. Complete the golf tournament section of the Registration Form in this brochure. The deadline for registration is December 1, 2003. Payment must be made at time of registration. No cancellations are allowed, but another person may be substituted for a registrant at any time.

Exhibitor Opportunities

Each exhibit space includes a 10 ft. by 10 ft., draped and carpeted space, and one full conference registration, which includes attendance at conference activities. Additional staff will be admitted at $250 each. Exhibit space reservation is $2195 (includes 20% nonrefundable cancellation fee).

Exhibit Hours. Exhibits will be open Monday at 11:30 a.m. for the ribbon-cutting and champagne toast and will remain open through the Reception (5:45-7:15 p.m.); Tuesday from 8:00 a.m. through 6:30 p.m.; and Wednesday from 8:00 a.m. through 12:15 p.m.

General Information

- **Badges:** Conference badges for both delegates and guests will be required for admittance to all conference functions.
- **Recommended Dress:** Business casual attire is appropriate for all meetings and social functions.
- **Cellular Phones:** As a courtesy to presenters and fellow delegates, please turn off all cellular phones during the technical sessions.

GTI-03/0151 9/03 ABS80M

Registration Form

Natural Gas Technologies II: Ingenuity & Innovation

February 8-11, 2004 • Pointe South Mountain Resort, Phoenix, Arizona

Delegate Registration

Please print or type. To register additional attendees, copy this form and submit a separate form for each registrant.

☐ Mr. ☐ Ms. ☐ Mrs. ☐ Dr. ☐ Prof. ☐ Other _____ Last Name _____

First Name _____ Initial _____ First name as you would like it appear on your badge _____

Title _____

Organization _____

Address _____

City/State/Postal Code/Country _____

Phone _____ Fax _____

E-mail _____

Accompanying Guest(s) Registration

For additional guests, copy this form and attach to this registration.

☐ Mr. ☐ Ms. ☐ Mrs. ☐ Dr. ☐ Prof. ☐ Other _____ Last Name _____

First Name _____ Initial _____ First name as you would like it appear on your badge _____

Payment Summary

For additional team delegates, copy this form and attach to this registration.

Delegate Registration	$595 submitted by Nov. 8; $695 submitted Nov. 9–Dec. 31; $795 after Dec. 31	$_____
Accompanying Guests	___@ $40 each	$_____
Presenter	$150 (fee applies to one presenter per paper, additional authors of paper pay full fee; presenters of more than one paper pay only once)	$_____
Exhibitor	$250 (fee applies to each additional exhibit staff; one full registration is complimentary with each booth)	$_____
Team Discount	3 or more from the same company registering at the same time save $100 per delegate from the fee applicable at time of registration. Each team member must submit a separate registration form. Required for team discount are the names of additional team members. Please list below.	
	_____ _____	
	_____ _____	
Golf Tournament	$175—deadline is Dec. 1; payment must be made at time of registration. No cancellations are allowed, but another person may be substituted for a registrant at any time.	$_____

Method of Payment

Credit cards, checks, or money orders. Payment accepted in U.S. dollars only. Checks made payable to the NGT II Conference (personal checks will be accepted only if drawn on U.S. banks). Name of registrant and NGT II Conference must be indicated on all checks and money orders.

☐ I am enclosing a check or money order for $_____ Check or money order # _____

☐ MasterCard ☐ Visa ☐ American Express Card No. _____ Exp. Date _____

Cardholder Name _____ Signature _____

Track Preferences

Please indicate below which track (topic area) you are most interested in to help us allocate space. Select all that you are likely to attend.

☐ Environmental
☐ DOE-NETL Natural Gas Forum
☐ Distribution
☐ Combustion
☐ Exploration & Production
☐ Transmission
☐ Fuel Cells/Hydrogen
☐ Gas Quality/Odorization
☐ Distributed Generation
☐ Technical Spectrum

Conference Events Registration

Please indicate below which events you plan to attend.

	Breakfast	Lunch	Reception
Monday	☐	☐	☐
Tuesday	☐	☐	
Wednesday	☐	☐	

Your company can be a sponsor.
Receive a free booth and complimentary conference registration. Contact Paul Reneau at 847-768-0780; paul.reneau@gastechnology.org.

Emergency Contact

In case of an emergency during the conference, please contact:

Name (please print clearly) _____

Daytime Phone _____ Evening Phone _____

Exhibit Spaces Still Available

If your company is interested in reserving exhibit space, please fill out the form below and we will send you an exhibitor information package.

Organization _____ Contact Person _____

Address _____

City/State/Postal Code/County _____

Phone _____ Fax _____ E-mail _____

Please **mail** the registration form with credit card information, check, or money order to:
NGT Conference Coordinator
c/o Gas Technology Institute
1700 South Mount Prospect Road
Des Plaines, IL 60018-1804 U.S.A.

Registrations will also be accepted by FAX if accompanied by credit card information for payment of fees.
FAX: 847-768-0842
Phone: 847-768-0950

Or register online using our secure e-commerce system:
www.gastechnology.org/ngt

For questions about registrations, contact our Conference Coordinator at ngt@gastechnology.org.

Registration confirmations will be mailed the week of January 19. To ensure confirmation of registration payment by mail, the registration form and all payments must be received by January 16. Receipts for fees received after January 16 may be picked up at the registration desk at the conference.

For Internal Use Only
Received Date _____ Entered _____
CC Approval _____ Check # _____
CC Batch _____ Amt. Rcvd _____
Note _____

See the conference web page for updated information.
Go to **www.gastechnology.org/ngt.**

gti SM

Gas Technology Institute
1700 South Mount Prospect Road
Des Plaines, Illinois 60018-1804

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